

ENTERED

December 23, 2024

Nathan Ochsner, Clerk

**UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION****IMPULSE DOWNHOLE SOLUTIONS
LTD., et al.,***Plaintiffs,***VS.****DOWNHOLE WELL SOLUTIONS, LLC,***Defendant.*§
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§**CIVIL ACTION NO. 4:23-CV-2954****MEMORANDUM & ORDER**

Before the Court are the claim construction briefs filed by parties in this patent infringement suit. On November 26, 2024, the Court held a hearing, in accordance with *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996), during which the parties presented argument in support of their proposed constructions. After considering the arguments of counsel, the evidence, and the applicable law, the Court finds that the disputed claims of the patents-in-suit should be construed as set forth herein.

I. BACKGROUND

Plaintiff Impulse Downhole Solutions LTD (“Impulse”) brought this case alleging infringement of U.S. Patent Nos. 9,637,976 (“the ’976 Patent”), 9,765,584 (“the ’584 Patent”), 10,633,920 (“the ’920 Patent”), 10,648,265 (“the ’265 Patent”), and 11,268,337 (“the ’337 Patent”) against Defendant Downhole Well Solutions, LLC (“DWS”).

The asserted patents relate to friction reduction tools used in directional oil drilling. There are two types of oil drilling: vertical drilling and directional drilling. In vertical drilling, the drill string extends downward, perpendicular to the earth’s surface, until it reaches the oil deposit.

However, when an oil rig cannot be positioned directly over an oil deposit, directional drilling is necessary. In directional drilling, the drill string extends both vertically and horizontally to reach the oil deposit.

One challenge with directional drilling is that it can cause friction between the drilling string and the interior of the wellbore as the drilling string moves horizontally. This friction can slow or stymie drilling progress. Friction can be mitigated by vibrating the drill string. Tools that produce this mitigating vibration are called friction reduction tools. Friction reduction tools produce vibrational pulses by varying the pressure of the drilling fluid running through the drill string. However, vibrating the string with rhythmic pressure patterns can interfere with other equipment, such as measurement and logging sensors that are also part of the drill string. As a result, irregular or polyrhythmic vibrations are desirable.

Patents '976 and '584 describe friction reduction tools that create irregular or polyrhythmic pressure patterns to achieve the desired vibrations. This is done through two related mechanical processes that affect the flow of the drilling fluid: (1) the interaction between the rotor and stator and (2) the interaction between the flow head and flow restrictor.

The remaining three patents, the '920, '265, and '337 Patents, all claim priority to the same provisional application. Additionally, the '337 Patent is a continuation of the '265 Patent. This family of patents allows for selective activation of friction reduction tools once the tools are downhole. The selective activation described in the '920, '265, and '337 Patents is triggered by dropping a ball or other projectile into the drill string from the surface. The projectile comes to rest on a ball catch seat. The projectile stops the fluid from flowing through the central passage of the tool, directing fluid around the ball catch. This altered fluid flow, in turn, triggers the friction reduction tool.

II. APPLICABLE LAW

A. Claim Construction

Claim construction is a matter of law, and the task of determining the proper construction of disputed terms therefore lies with the Court. *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 384 (1996). The goal of a *Markman* hearing is to arrive at the ordinary and customary meaning of claim terms in the eyes of a person of ordinary skill in the art (“POSITA”). *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005). There are only two exceptions to the ordinary meaning rule: “1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Computer Ent. Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

a. Readily Apparent Meaning

In some instances, this inquiry is quite straightforward. That is, where ordinary meaning is “readily apparent even to lay judges,” district courts merely apply “the widely accepted meaning” of the terms, perhaps with the aid of “general purpose dictionaries.” *Phillips*, 415 F.3d at 1313; *see also Mentor H/S, Inc. v. Med. Device Alliance, Inc.*, 244 F.3d 1365, 1380 (Fed. Cir. 2001) (finding no error in the lower court’s refusal to construe “irrigating” and “frictional heat”); *Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001) (finding no error in non-construction of “melting”). Indeed, “[a] district court is not obligated to construe terms with ordinary meanings, lest trial courts be inundated with requests to parse the meaning of every word in the asserted claims.” *Shell Glob. Sols. (US) Inc. v. RMS Eng’g, Inc.*, 782 F. Supp. 2d 317, 334 (S.D. Tex. 2011) (Ellison, J.).

b. Intrinsic Evidence

In most cases, though, claim terms have a particular meaning that may not be readily apparent. *See Phillips*, 415 F.3d at 1341. In such a scenario, courts look first to intrinsic evidence and assess whether such evidence clearly and unambiguously defines the disputed terms. *Vitronics Corp. v. Conceptiontronic, Inc.*, 90 F.3d 1576, 1585 (Fed. Cir. 1996). “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Id.* at 1582; *Personalized Media Commc’ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1340 (Fed. Cir. 2020) (“When construing claim terms, we first look to, and primarily rely on, the intrinsic evidence . . . which is usually dispositive.” (quoting *Sunovion Pharms., Inc. v. Teva Pharms. USA, Inc.*, 731 F.3d 1271, 1276 (Fed. Cir. 2013))). Intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *Phillips*, 415 F.3d at 1314.

i. Claim Language

An examination of the intrinsic evidence begins with the claim language. *Immunex Corp. v. Sanofi-Aventis U.S. LLC*, 977 F.3d 1212, 1218 (Fed. Cir. 2020). The claims themselves can provide substantial guidance as to the meaning of terms. *Phillips*, 415 F.3d at 1314. The context in which a term is used in the asserted claim can be instructive, and “other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term.” *Id.* Claim terms are most often used consistently throughout a patent, and so the usage of a term in one claim can often illuminate the meaning of the same term in other claims. *Id.*

ii. Specification

Claims, however, do not stand alone and “must be read in view of the specification, of which they are a part.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995). The specification, which describes and illustrates the invention in detail, “is always highly relevant

to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics*, 90 F.3d at 1582; *see also Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed. Cir. 1998) (“The best source for understanding a technical term is the specification from which it arose, informed, as needed, by the prosecution history.”).

However, courts must be careful not to limit the construction of a claim based on limitations set forth in the specification that are not a part of the claim. *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998); *Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, [the Federal Circuit has] repeatedly warned against confining the claims to those embodiments.”); *Andersen Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1373 (Fed. Cir. 2007) (noting that district court walk a difficult “tightrope” in using the specification to interpret a claim’s meaning, but not importing limitations from the specification into the claim). It is a general rule that “claims of a patent are not limited to the preferred embodiment . . . or to the examples listed within the patent specification.” *Glaxo Wellcome, Inc. v. Andrx Pharms., Inc.*, 344 F.3d 1226, 1233 (Fed. Cir. 2003) (quoting *Dow Chemical Co. v. United States*, 226 F.3d 1334, 1342 (Fed. Cir. 2000)).

iii. Prosecution History

Courts may also consider the prosecution history, which provides evidence of how the Patent and Trademark Office and the inventor understood the patent. *Phillips*, 415 F.3d at 1317. No party here presents evidence related to the asserted patents’ prosecution histories.

c. Extrinsic Evidence

In most circumstances, analysis of the intrinsic evidence alone will resolve claim construction disputes. *Vitronics*, 90 F.3d at 1583. However, if the intrinsic evidence does not

resolve ambiguities, a court may also consider extrinsic evidence such as expert witness testimony, dictionary definitions, and legal treatises. *Id.* at 1585. While extrinsic evidence can shed useful light on the relevant art—and thus better allow a court to place itself in the shoes of a POSITA—“intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Vanderlande Indus. Nederland BV v. I.T.C.*, 366 F.3d 1311, 1318 (Fed. Cir. 2004) (quoting *Vitronics*, 90 F.3d at 1582).

B. Indefiniteness

A claim is considered invalid if it fails to “particularly point out and distinctly claim the subject matter that the applicant regards as the invention.” 35 U.S.C. § 112(b). The Federal Circuit has explained:

The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent, so that interested members of the public, e.g., competitors of the patent owner, can determine whether or not they infringe. That determination requires a construction of the claims according to the familiar canons of claim construction.

Oakley, Inc. v. Sunglass Hut Int’l, 316 F.3d 1331, 1340 (Fed. Cir. 2003) (quoting *All Dental Prodx, LLC v. Advantage Dental Prods.*, 309 F.3d 774, 779-80 (Fed. Cir. 2002)).

The Supreme Court has interpreted § 112(b) to mean that “a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). The alleged infringer carries the burden of proving invalidity “by clear and convincing evidence.” *Titan Tire Corp. v. Case New Holland, Inc.*, 566 F.3d 1372, 1376 (Fed. Cir. 2009).

III. CONSTRUCTION OF AGREED TERM

A. “frat friction reduction tool”

The parties agreed prior to the *Markman* hearing that this claim should be construed to mean “first friction reduction tool.” The Court adopts this construction.

IV. CONSTRUCTION OF TERMS CHALLENGED FOR INDEFINITENESS

A. “substantially blocked,” “substantially stopped,” “substantially blocking,” and “substantially funnel-shaped”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that these claim terms are not indefinite. No construction is necessary as these claim terms carry their plain and ordinary meanings.

B. “the assembly,” “assemblies,” “the assemblies,” and “each assembly”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that these claim terms are not indefinite. The claim terms are construed to mean “the friction reduction assembly,” “the friction reduction assemblies,” “friction reduction assemblies,” and “each friction reduction assembly,” respectively.

V. CONSTRUCTION OF DISPUTED TERMS

A. “irregular pattern”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as this claim term carries its plain and ordinary meaning.

B. “a cyclic, polyrhythmic pattern”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court construes this term as “a pattern of: two or more different rhythms within one revolution of the flow head wherein a rhythm refers to either varying amplitude or duration between pressure peaks.”

C. “ports” and “passages”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as these claim terms carry their plain and ordinary meanings.

D. “passage” and “central passage”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as these claim terms carry their plain and ordinary meanings.

E. “eccentric” and “eccentrically”

Term	Patent/Claims	Impulse’s Construction	DWS’s Construction	Court’s Construction
“eccentric”	’976 Patent Claims 1, 10, 17	off-center	non-circular/non-circularly	off-center
“eccentrically”	’976 Patent Claims 1, 10, 12, 16			

The terms “eccentric” and “eccentrically” appear in the context of an “eccentrically-driven rotor,” an “eccentric rotational motion,” and an “eccentric rotation.” ’976 Patent Claims 1, 10, 12, 16, 17. Impulse initially argued that no construction was necessary because these terms were being given their ordinary meaning. DWS sought to give the terms the meaning of “non-concentric.” At the *Markman* hearing, the Court found both proposals inadequate and ordered the parties to submit supplemental briefing on the construction of “eccentric” and “eccentrically.”

Now, DWS argues that the terms should be construed as “non-circular/non-circularly.” However, DWS also seeks to construe “rotational motion” as “circular motion.” These two proposals create odd results in combination. If rotational means circular, and eccentric means non-

circular, “eccentric rotational motion” would have the contradictory meaning of non-circular circular motion. Moreover, DWS’s proposed construction is contrary to the unrefuted testimony of Impulse’s expert, who stated that “eccentric” and “concentric” are not opposites, and that “eccentric” therefore does not necessarily mean “non-concentric.” Kytömaa Dep. 39:3-40:2. The same logic would apply to the relationship between “eccentric” and “non-circular.”

Impulse argues that the terms should be construed as “off-center,” and this construction is supported by intrinsic and extrinsic evidence. First, the claims of the ‘976 Patent repeatedly refer to an “eccentrically-driven rotor” and “eccentric rotation with respect to the flow restrictor,” and this claim language can be understood as describing rotation off-center with respect to the center axis of the tool. Second, the specification explains that the rotor-stator assembly has “an unequal ratio” of lobes that produces “a staggered eccentric motion of the rotor” vis-à-vis the stator when the rotor is rotated. ’976 Patent at 3:56–60. The specification supports the construction of “eccentric motion” as motion that is off-center with respect to the central axis of the tool. Finally, Impulse presents extrinsic evidence in the form of technical dictionaries describing eccentric rotational movement as an object (e.g., a rotor or flow head) that rotates about a different center from the center of the object. ECF No. 77 at 3.

Accordingly, the Court adopts the construction of “eccentric” and “eccentrically” as off-center.

F. “rotational motion”

Term	Patent/Claims	Impulse’s Construction	DWS’s Construction	Court Construction
“rotational motion”	‘584 Patent Claims 1, 31, and 36	No construction necessary	Non-eccentric (concentric) motion	No construction necessary

DWS proposes a construction of “rotational motion” that would limit it to non-eccentric (i.e., concentric) motion.¹ Impulse argues that this improperly limits the term “rotational motion,” which includes both eccentric and concentric motion. Additionally, as discussed above, Impulse argues that concentric and eccentric are not necessarily opposites of each other.

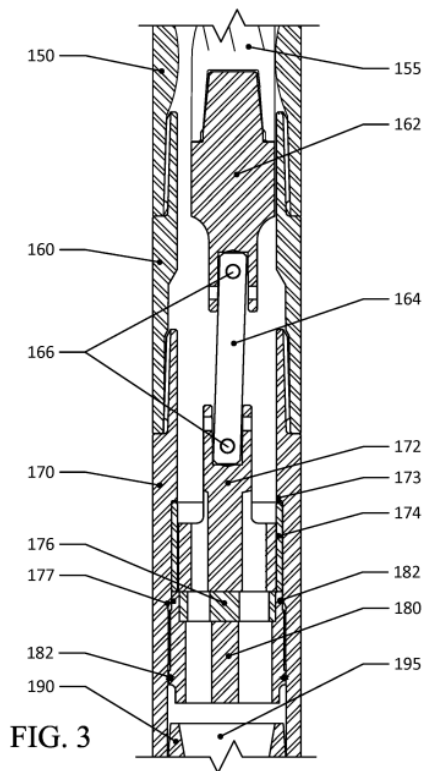


FIG. 3

To support its reading, DWS relies on the ‘584 Patent’s description of an embodiment in the specification, displayed in Figure 3. The specification states, “The lower external diameter of the flow head is sized to fit within the radial bearing 174 such that the radial bearing 174 constrains the motion of the flow head 172 to substantially rotational (non-eccentric) motion.” ‘584 Patent at 5:61-65. DWS argues that the parenthetical “(non-eccentric)” is meant to define “rotational.”

Elsewhere the specification states, “The drive shaft 164 in turn induces corresponding motion in the flow head 172, and in view of the drive shaft connection and the constraint on the motion of the flow head 172, the flow head’s motion is limited to rotational movement (i.e., rotational movement around a central axis of the flow head body).” ‘584 Patent at 9:34-39. DWS again argues that the parenthetical is meant to define “rotational movement,” and that movement around a single central axis is the definition of concentric.

¹ DWS’s supplemental proposal is to construe “rotational motion” as “circular motion.” ECF No. 78 at 3. The Court did not request supplemental briefing on the construction of “rotational motion,” but insofar as the supplemental proposal is considered, it is rejected for the same reasons as the original proposed construction of “non-eccentric (concentric) motion.”

The crux of this dispute is whether to read these parentheticals as *defining* the preceding term (i.e., rotational motion) or as *describing* which type of rotational motion is at issue in the particular embodiments in the specification. If it's the former, then the term "rotational motion" should be limited accordingly. If it's the latter, then limiting "rotational motion" to only "non-eccentric" rotational motion would be akin to committing the "cardinal sin" of "reading a limitation from the written description into the claims." *Phillips*, 415 F.3d at 1319-20.

In the Court's view, the latter is the correct interpretation. That is, the Court reads the parentheticals as descriptions of what type of rotational motion is seen in that particular embodiment. Notably, the embodiment being described is one where "the flow head . . . rotates under influence of the rotor within a radial bearing." '584 Patent at 5:58-60. The "radial bearing constrains the motion of the flow head to substantially rotational (non-eccentric) motion." *Id.* at 5:62-65. However, unlike this embodiment, the asserted claims do not require any such radial bearing to constrain the motion of the flow head.

Moreover, DWS's reading would nullify dependent Claim 10, which describes "[t]he downhole tool assembly of claim 9, further comprising a bearing constraining motion of the flow head to rotational motion around the central axis." Claim 9, in turn, is a dependent claim relying on Claim 1. If all uses of "rotational motion" are read to mean concentric motion or motion around the central axis, as DWS proposes, then Claim 10 has no feature differentiating it from Claim 9. Interpretations rendering claim language superfluous are disfavored. *See Akzo Nobel Coatings, Inc. v. Dow Chem. Co.*, 811 F.3d 1334, 1339 (Fed. Cir. 2016). In the Court's view, the better reading is that Claim 1 and Claim 9 require only rotational motion, whereas Claim 10 is narrower

and requires a specific component, i.e., a bearing, to facilitate rotational motion around a central axis.²

Accordingly, the Court rejects DWS’s construction, as “rotational motion” can include both eccentric and non-eccentric rotational movement. The Court finds that “rotational motion” needs no construction as it carries its ordinary meaning.

G. “alignment”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as this claim term carries its plain and ordinary meaning.

H. Port Size Terms

Term	Patent/Claims	Impulse’s Construction	DWS’s Construction	Court’s Construction
“a plurality of ports having at least two different cross-sectional areas”	’976 Patent Claim 2	No construction necessary	two or more ports in each of the flow head and the flow restrictor where the ports of the flow head comprise at least two different cross-sectional areas, measured at the face, and the ports of the flow restrictor comprise at least two different cross-sectional areas,	No construction necessary
“the plurality of ports including ports of different sizes”	’976 Patent Claim 10			
“the plurality of ports in the flow head comprising	’976 Patent Claim 17			

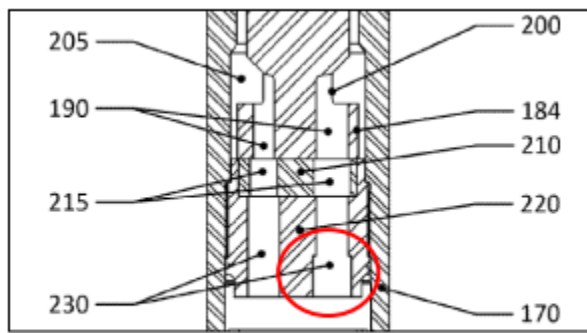
² Impulse makes a second, less persuasive argument that that rotational motion includes “eccentric” rotational motion based on the ‘976 Patent, which refers in Claim 1 to “eccentric rotational motion.” However, terms in the ‘976 Patent are not required to be construed identically to those in the ‘584 Patent. *See Trustees of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1369 (Fed. Cir. 2016) (declining to construe the same term identically across patents that “claim two different inventions, list only one inventor in common, were filed years apart, and do not result from the same patent application”).

different sizes and the plurality of ports in the flow restrictor comprising different sizes”			measured at the face Alternatively, indefinite	
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The port size terms at issue appear in dependent claims that narrow the requirement of a “plurality of ports” by qualifying that the ports must have either different cross-sectional areas or different sizes. DWS argues that the terms should be construed as “two or more ports in each of the flow head and the flow restrictor where the ports of the flow head comprise at least two different cross-sectional areas, measured at the face, and the ports of the flow restrictor comprise at least two different cross-sectional areas, measured at the face” or should be regarded as indefinite. Impulse suggests that no construction is necessary for these terms as they carry their plain and ordinary meaning. The Court agrees with Impulse.

The first issue raised by this construction dispute is whether “different sizes” should be defined as different cross section areas, as measured at the face. DWS’s proposed constructions impose two limitations on the meaning of “size”: (1) size should be measured exclusively by cross-sectional area (as opposed to length, volume, etc.) and (2) the size measurement should be taken at the face of the flow restrictor or flow head, as opposed to elsewhere.

The following examples of ports from the asserted patents’ specifications provide context for this dispute. Figure 2 of the ’976 Patent depicts a port with an internal shoulder, whereas Figure 13 of the ’584 Patent shows a tapered port. In both cases, the cross-sectional area at the face is different than the cross-sectional area elsewhere.



'976 Patent Figure 2

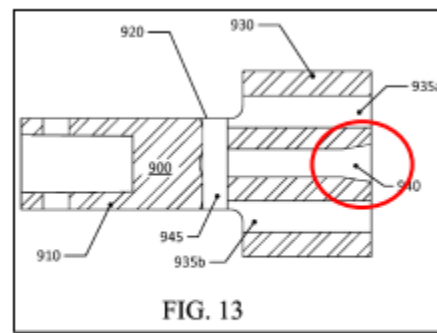


FIG. 13

'584 Patent Figure 13

DWS provides no support for its contention that “size” should be measured based on the cross-sectional area of the face of a port. It cites to a passage from the ’584 Patent describing ports as being “on the face” of the flow head and flow restrictor, but that section does not reference the size of the ports or give any indication of how the size of a port should be measured. Moreover, this section says nothing about cross-sectional area being the proper measure of size.³

Further, as demonstrated by Claim 2 of the ’976 Patent, the inventors were able to define specifics like “cross-sectional area” when desired. Reading that requirement into other claims would render the “cross sectional area” requirement of Claim 2 null, which is disfavored. *See Nobel Coatings*, 811 F.3d at 1340. Therefore, the Court finds that “size” carries its ordinary meaning and that ports are the same size if *all* of their dimensions are the same.

DWS briefly argues in the alternative that if these claims are not given a construction, they are indefinite because it is unclear how size should be measured. This issue was not briefed at length, but the Court does not see an indefiniteness issue. Since the Court finds that “different size”

³ Even if DWS is correct that the only place where size is relevant is at the head of the port, cross-sectional area isn’t necessarily the best way to measure size. For example, an oval and a circle could have the same cross-sectional areas despite the fact that other cross-sectional dimensions (e.g., radii, diameters, circumferences, etc.) are different. There is no basis in the text for finding that size should be defined based on area rather than other measurements that also describe the configuration of the opening of a port.

has its ordinary meaning (i.e., having different dimensions), there is no uncertainty about whether a given tool meets this criterion.

Likewise, for Claim 2 of the '976 Patent, which requires the device to have “a plurality of ports having at least two different cross-sectional areas,” this term is not indefinite simply because it is not limited to different cross-sectional areas measured at the head. That is, it should be read to mean that if the cross-sectional areas differ from each other at any point, the ports have “different cross-sectional areas.”

The final issue is related to the last two disputed terms. Both appear in Patent '584 Claim 30, which states “wherein the flow head comprises a number of ports of at least two different sizes and the flow restrictor comprises a different number of ports of at least two different sizes.” DWS argues that these terms need to be constructed to make clear that the second number is different from the first number. Impulse agrees that the numbers referenced must be different but argues that the ordinary meaning of the terms already makes it clear that they must be different numbers. The Court agrees with Impulse that the plain meaning of the text makes it clear that the second number must be different than the first insofar as it explicitly says, “a different number of ports.”

The Court thus rejects DWS’s arguments and determines that these six port size terms need no construction as they carry their ordinary meaning.

I. “constrained to”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that this claim term carries its plain and ordinary meaning which is “limited to” or “restricted to.”

J. “by the means of an inverter sub”

Term	Patent/Claims	Impulse's Construction	DWS's Construction	Court's Construction
"by means of an inverter sub"	'584 Patent Claim 34	<p>Function: to induce a variation in pressure in the drilling string corresponding to a variation in flow of the drilling fluid.</p> <p>Structure: a housing and a shock absorbing and releasing assembly, such as a mechanical spring assembly, and equivalents thereof.</p>	<p>Function: inducing a variation in pressure in the drilling string corresponding to a variation in flow of the drilling fluid.</p> <p>Structure: an inverter system imparting an axial movement to a mandrel.</p>	<p>Function: to induce a variation in pressure in the drilling string corresponding to a variation in flow of the drilling fluid.</p> <p>Structure: an inverter system comprising a housing and a shock absorbing and releasing assembly, such as a mechanical spring assembly, and equivalents thereof.</p>

The parties agree that this claim is a means plus function claim subject to 35 U.S.C. § 112(f). Accordingly, the Court must define both the function of the inverter sub and the means through which it achieves that function.

The parties agree as to the function; the only dispute is over the corresponding structure. To ascertain the corresponding structure, the court must look to the specification to determine whether the patentee has disclosed a structure to perform the claimed function. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1351 (Fed. Cir. 2015). A "[s]tructure disclosed in the specification qualifies as 'corresponding structure' if the intrinsic evidence clearly links or associates that structure to the function recited in the claim." *Id.* at 1352.

Both of the proposed structures are drawn from the '584 Patent's specification. Impulse's proposed structure comes from an embodiment in the specification which describes the inverter

sub as follows: “[t]he inverter sub 130 is provided with a shock absorbing and releasing assembly 135, in this example a mechanical spring assembly disposed in an annular space within the inverter sub housing 130, which stores and releases kinetic energy resulting from the pressure build-ups resulting from rotation of the flow head 172 discussed below.” ’584 Patent at 4:43-47. In contrast, DWS draws its proposed structure from the specification’s statement that a “mandrel 110 is splined to an inverter system, here referred to as an inverter sub.” ’584 Patent at 4:26-28. The ’584 Patent further explains that the “inverter sub impart[s] axial movement to a mandrel.” *Id.* at 2:62-63, 13:28-30.

As Impulse identifies, the problem with DWS’s proposed structure is that it does not describe the structure of an inverter sub. Instead, it states in a circular fashion that an “inverter sub” is “an inverter system” and then goes on to describe the *effect* of the inverter sub (i.e., that it imparts an axial movement to a mandrel). No part of DWS’s proposed structure definition describes the mechanical components of the inverter sub that allow it to perform its function. In contrast, Impulse’s proposed structure does describe the mechanical components of the inverter sub as they appear in the specification (i.e., a housing and a shock absorbing and releasing assembly, such as a mechanical spring assembly). DWS argues that Impulse’s proposed structure should be rejected because it appears only once in the specification and does not appear in a preferred embodiment of the ’584 Patent. However, these facts are of no legal consequence—the structure need no appear multiple times or be in the preferred embodiment.

At the *Markman* hearing, Impulse indicated that it was willing to combine the parties proposed structures as “an inverter system comprising a housing and a shock absorbing and releasing assembly, such as a mechanical spring assembly, and equivalents thereof.” ECF No. 75 at 107:12-22. This combination would include DWS’s proposed language of “an inverter system”

but would exclude the problematic language describing the effect of the inverter sub rather than its mechanical components.

Accordingly, the Court adopts the parties agreed function of “to induce a variation in pressure in the drilling string corresponding to a variation in flow of the drilling fluid,” and the Court adopts Impulse’s proposed combined structure of “an inverter system comprising a housing and a shock absorbing and releasing assembly, such as a mechanical spring assembly, and equivalents thereof.”

K. “activatable,” “activate,” “activating,” and “activated”

As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as these claim terms carry their plain and ordinary meanings.

L. “activation tool”


As the Court held at the *Markman* hearing, and for the reasons stated on the record, the Court concludes that no construction is necessary as this claim term carries its plain and ordinary meanings.

VI. CONCLUSION

The disputed terms in the patents-in-suit are construed as set forth in this Order.

IT IS SO ORDERED.

SIGNED at Houston, Texas, on this the 23rd day of December, 2024.


KEITH P. ELLISON
UNITED STATES DISTRICT JUDGE